

**WHAT IS CLAIMED IS:**

1. A helicopter comprising:
  - a power unit comprising at least one rotor and an engine coupled to drive the rotor;
  - 5 an airframe suspended from the power unit, the airframe pivotally coupled to the power unit for pivoting about pitch and roll axes relative to the power unit; and,
  - a plurality of control actuators coupled between the airframe and the power unit, the control actuators adjustable to set pitch and roll angles of the airframe relative to the power unit.
2. A helicopter according to claim 1 wherein the pitch and roll axes intersect.
- 15 3. A helicopter according to claim 1 wherein the plurality of control actuators comprises left and right control actuators positioned symmetrically on either side of the roll axis at locations spaced rearwardly from a location at which the pitch and roll axes intersect.
- 20 4. A helicopter according to claim 1 wherein the airframe is coupled to the power unit by a support member, the airframe is pivotally mounted to the support member for rotation about a trim axis parallel to the pitch axis, and the helicopter comprises a trim actuator connected between the airframe and the support member,
- 25 the trim actuator operable to move the power unit forward and rearward relative to the airframe.
- 30 5. A helicopter according to claim 4 wherein the trim actuator comprises a linear actuator which is controllably extendable and retractable to adjust an angle of the airframe relative to the support member.

6. A helicopter according to claim 4 wherein the support member is arch-shaped and comprises a pair of downwardly extending arms and wherein the airframe is pivotally coupled to each of the arms.
- 5 7. A helicopter according to claim 6 wherein the airframe comprises a longitudinally extending support member and a pair of transversely extending struts which project from either side of the longitudinally extending support member and wherein the arms are each coupled to one of the transversely extending struts.
- 10 8. A helicopter according to claim 7 wherein the transversely extending struts are provided by a cylindrical tubular member which penetrates the longitudinally extending support member.
- 15 9. A helicopter according to claim 6 wherein each of the arms connects to a corresponding strut which projects transversely from one side of the airframe.
- 20 10. A helicopter according to claim 9 comprising a cockpit located between the arms.
11. A helicopter according to claim 3 wherein the control actuators each comprise a linear actuator.
- 25 12. A helicopter according to claim 11 wherein the control actuators each comprise a self-centering mechanism.
13. A helicopter according to claim 11 wherein the linear actuators each comprise a hydraulic actuator.
- 30 14. A helicopter according to claim 13 wherein each hydraulic actuator comprises:  
a cylinder housing having a bore divided into two hydraulic cavities; and

a piston rod which extends into the bore of the cylinder housing, the piston rod comprising a pair of pistons, each of which is located in a corresponding one of the hydraulic cavities, to divide each hydraulic cavity into a pair of volumes.

5

15. A helicopter according to claim 14 comprising a hydraulic controller connected to a source of hydraulic fluid, the hydraulic controller connected to supply hydraulic fluid to and remove hydraulic fluid from selected ones of the the volumes to controllably move the piston rods relative to their associated cylinder housings.  
10
16. A helicopter according to claim 15 wherein the hydraulic controller is controllable to cause simultaneous extension or simultaneous retraction of both control actuators, resulting in a pivoting movement of the power unit relative to the air frame about the pitch axis.  
15
17. A helicopter according to claim 15 wherein the hydraulic controller is controllable to cause simultaneous extension of one control actuator and retraction of the other control actuator, resulting in a pivoting movement of the power unit relative to the air frame about the roll axis.  
20
18. A helicopter according to claim 1 wherein the power unit comprises first and second engines symmetrically located on either side of the roll axis.  
25
19. A helicopter according to claim 18 wherein the first and second engines comprise jet turbine engines.  
30
20. A helicopter according to claim 19 wherein the first and second engines are coupled to turn the rotor by way of a transmission and

each of the first and second engines is coupled to the transmission by a belt drive.

21. A helicopter according to claim 20 wherein the transmission is  
5 located between the first and second engines.
22. A helicopter according to claim 1 wherein the airframe comprises a  
longitudinally extending support member which supports a front  
seat and a rear seat located behind the front seat.  
10
23. A helicopter according to claim 22 comprising a cockpit bubble  
attached to the longitudinally extending support member and  
surrounding the front and rear seats.
- 15 24. A helicopter according to claim 1 comprising a landing gear  
assembly which comprises a bent tubular member having an upper  
end attached to the helicopter, a lower end, and a bent portion  
between the upper and lower ends, the bent portion having a bore  
filled with a plug of a resilient material.  
20
25. A helicopter according to claim 24 wherein the landing gear  
assembly comprises a cross brace coupled between the upper and  
lower ends of the bent tubular member, the cross brace comprising  
a first member slidably received in a second member.  
25
26. A helicopter according to claim 25 wherein the second member is  
tubular and the first member is received in a bore of the second  
member.
- 30 27. A helicopter according to claim 26 comprising a plug secured  
within the bore of the second member, wherein, upon excessive  
compression of the bent tubular member, an end of the first  
member comes into contact with an end of the plug.

28. A helicopter according to claim 24 wherein the airframe comprises a transversely extending strut and the upper end of the bent tubular member passes through holes in the transversely extending strut.
- 5 29. A helicopter according to claim 28 wherein the landing gear assembly comprises a cross brace coupled between the upper and lower ends of the bent tubular member and wherein an upper end of the cross brace passes through holes in the transversely extending strut and the upper end of the bent tubular member.
- 10 30. A helicopter according to claim 29 wherein the upper end of the bent tubular member and the upper end of the cross brace intersect the transversely extending strut at right angles.
- 15 31. A helicopter according to claim 30 comprising an end cap on the transversely extending strut and a bolt extending through the end cap, the upper end of the bent tubular member and the upper end of the cross brace.